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10/584,218

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EXAMINER

CULLEN, SEAN P

ART UNIT

PAPER NUMBER

1795

NOTIFICATION DATE

DELIVERY MODE

02/19/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/584,218	<b>Applicant(s)</b> MIYACHI ET AL.	
	<b>Examiner</b> Sean P. Cullen	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 24-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 24-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>06/23/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Objections***

1. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 24-36 must be renumbered 18-30.

2. Claim 6 objected to because of the following informalities:

Claim 6 recites "as claimed Claim 1." It should recite "as claimed in Claim 1."

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2 and 4 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites "0.8□z□2." The character "□" is unclear. For the purpose of this office action, "0.8□z□2" will be treated as "0.8≤z≤2" as recited in the previously presented claims.

Claim 4 recite "y□4." The character "□" is unclear. For the purpose of this office action, "y□4" will be treated as "y≤4" as recited in the previously presented claims.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-2, 5-9, 12-13 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Inoue et al. (JP 09245771, see machine translation).

Regarding claim 1, Inoue et al. discloses an anode material [0019] for a secondary battery (Drawing 1) having at least an anode (1), a cathode (2) and a lithium-ion conducting non-aqueous electrolyte [0007] comprising:

- an Si oxide and at least one noble metal (see  $\text{SiAgO}_{1.5}$ , [0019]).

The machine translation of Inoue et al. mistranslates “negative pole material capable of storing and discharging lithium ion” (see English abstract of JP 09245771 A) to “cathode material which can emit [occlusion and] a lithium ion” (see claim 1). Further, negative pole material is mistranslated to cathode material throughout the machine translation.

Regarding claim 2, Inoue et al. discloses all claim limitations set forth above and further discloses an anode material for a secondary battery:

- wherein when the Si oxide is expressed in  $\text{SiO}_z$ ,  $0.8 \leq z \leq 2$  (see  $\text{SiAgO}_{1.5}$ , [0019]).

Regarding claim 5, Inoue et al. discloses all claim limitations set forth above and further discloses an anode material for a secondary battery:

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- further comprising lithium metal (see “These may be compound oxides with lithium,” [0019]).

Regarding claim 6, Inoue et al. discloses all claim limitations set forth above and further discloses an anode material for a secondary battery:

- wherein the noble metal is at least one metal selected from the group consisting of Pd, Ag, Pt, Au, Rh, Ir, Ru, Os and Re (see  $\text{SiAgO}_{1.5}$ , [0019]).

Regarding claim 7, Inoue et al. discloses all claim limitations set forth above and further discloses an anode material for a secondary battery:

- wherein when a ratio of Si atoms to noble-metal atoms is expressed in a:b,  $0.01 < b/a$  (see  $\text{SiAgO}_{1.5}$ , [0019],  $b/a = 1/1 = 1 > 0.01$ ).

Regarding claim 8, Inoue et al. discloses all claim limitations set forth above and further discloses an anode material for a secondary battery:

- partially or wholly having an amorphous structure (see mainly amorphous, [0020]).

Regarding claim 9, Inoue et al. discloses an anode (1) for a secondary battery (Drawing 1) comprising:

- an activator layer (see electrode mixture, [0003]) having a film-structure anode activator (see film, [0004]) which comprises
  - the anode material [0019] for a secondary battery (Drawing 1) as claimed in Claim 1 (see  $\text{SiAgO}_{1.5}$ , [0019])
  - on at least one side of an anode collector (see current collection object, [0007]).

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Regarding claim 12, Inoue et al. discloses an anode (1) for a secondary battery (Drawing 1) comprising:

- an activator layer (see electrode mixture, [0003]) having a particulate-structure anode activator (see particle, [0015]) which comprises
  - the anode material [0019] for a secondary battery (Drawing 1) as claimed in Claim 1 (see  $\text{SiAgO}_{1.5}$ , [0019])
  - on at least one side of an anode collector (see current collection object, [0007]).

Regarding claim 13, Inoue et al. discloses all claim limitations set forth above and further discloses an anode for a secondary battery:

- wherein the anode activator is formed by mechanical processing [0014].

Regarding claim 16, Inoue et al. discloses all claim limitations set forth above and further discloses an anode for a secondary battery:

- wherein the anode activator is further heat-treated (see calcination, [0014]).

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 3-4, 24-25, 28-29, 32, 34 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (JP 09245771, see machine translation).

Regarding claim 3, Inoue et al. discloses an anode material [0019] for a secondary battery (Drawing 1) having at least an anode (1), a cathode (2) and a lithium-ion conducting non-aqueous electrolyte [0007] comprising:

- a lithium silicate (see “These may be compound oxides with lithium,” [0019]) and at least one noble metal (see  $\text{SiAgO}_{1.5}$ , [0019]).

Inoue et al. does not explicitly disclose an anode material of a lithium silicate and a noble metal. Inoue et al. discloses an anode material of a silicon oxide and a noble metal which may

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be compounded with lithium. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make an anode material of a lithium silicate and a noble metal by compounding the  $\text{SiAgO}_{1.5}$  with lithium as described by Inoue et al.

Regarding claim 4, Inoue et al. discloses all claim limitations set forth above and further discloses an anode material for a secondary battery:

- wherein when the lithium silicate (see  $\text{SiO}$  and “These may be compound oxide with lithium oxide,” [0018]) is expressed in  $\text{Li}_x\text{SiO}_y$ ,  $0 < x$  and  $0 < y \leq 4$ .

Inoue et al. does not explicitly disclose the molecular formula of the compound oxide formed. Inoue et al. discloses an anode material of a silicon oxide may be compounded with lithium oxide to form a compound oxide which would form  $\text{Li}_2\text{SiO}_2$ . Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make an anode material of a silicon oxide compounded with lithium oxide to form a compound oxide which would form  $\text{Li}_2\text{SiO}_2$

Regarding claim 24, Inoue et al. discloses all claim limitations set forth above and further discloses an anode material for a secondary battery:

- partially or wholly having an amorphous structure (see mainly amorphous, [0020]).

Regarding claim 25, Inoue et al. discloses an anode (1) for a secondary battery (Drawing 1) comprising:

- an activator layer (see electrode mixture, [0003]) having a film-structure anode activator (see film, [0004]) which comprises



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- the anode material [0019] for a secondary battery (Drawing 1) as claimed in Claim 3 (see  $\text{SiAgO}_{1.5}$ , and “These may be compound oxides with lithium,” [0019])
- on at least one side of an anode collector (see current collection object, [0007]).

Inoue et al. does not explicitly disclose an anode material of a lithium silicate and a noble metal. Inoue et al. discloses an anode material of a silicon oxide and a noble metal which may be compounded with lithium. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make an anode material of a lithium silicate and a noble metal by compounding the  $\text{SiAgO}_{1.5}$  with lithium as described by Inoue et al.

Regarding claim 28, Inoue et al. discloses an anode (1) for a secondary battery (Drawings1) comprising:

- an activator layer (see electrode mixture, [0003]) having a particulate-structure anode activator (see particle, [0015]) which comprises
  - the anode material [0019] for a secondary battery (Drawing 1) as claimed in Claim 3 (see  $\text{SiAgO}_{1.5}$ , and “These may be compound oxides with lithium,” [0019])
  - on at least one side of an anode collector (see current collection object, [0007]).

Inoue et al. does not explicitly disclose an anode material of a lithium silicate and a noble metal. Inoue et al. discloses an anode material of a silicon oxide and a noble metal which may be compounded with lithium. Therefore, it would have been obvious to one of ordinary skill in

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the art at the time of the invention to make an anode material of a lithium silicate and a noble metal by compounding the  $\text{SiAgO}_{1.5}$  with lithium as described by Inoue et al.

Regarding claim 29, Inoue et al. discloses all claim limitations set forth above and further discloses an anode for a secondary battery:

- wherein the anode activator is formed by mechanical processing [0014].

Regarding claim 32, Inoue et al. discloses all claim limitations set forth above and further discloses an anode for a secondary battery:

- wherein the anode activator is further heat-treated (see calcination, [0014]).

Regarding claim 34, Inoue et al. discloses a non-aqueous electrolytic solution secondary battery (Drawing 1) comprising:

- the anode (1) for a secondary battery (Drawing 1) as claimed in Claim 25 (see  $\text{SiAgO}_{1.5}$ , and “These may be compound oxides with lithium,” [0019]; [0003], [0004] and [0007]).

Inoue et al. does not explicitly disclose an anode material of a lithium silicate and a noble metal. Inoue et al. discloses an anode material of a silicon oxide and a noble metal which may be compounded with lithium. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make an anode material of a lithium silicate and a noble metal by compounding the  $\text{SiAgO}_{1.5}$  with lithium as described by Inoue et al.

Regarding claim 36, Inoue et al. discloses a non-aqueous electrolytic-solution secondary battery (Drawing 1) comprising:

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- the anode (1) for a secondary battery (Drawing 1) as claimed in Claim 28 25 (see  $\text{SiAgO}_{1.5}$ , and “These may be compound oxides with lithium,” [0019]; [0003], [0007] and [0015]).

11. Claims 10-11, 14-15, 26-27 and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (JP 09245771, see machine translation) as applied to claims 9, 12, 25 and 28 above, in further view of Ikeda et al. (EP 1,231,654).

Regarding claims 10-11, 14-15, 26-27 and 30-31, Inoue et al. discloses all claim limitations set forth above, but does not explicitly disclose:

- wherein the activator layer is formed by a vacuum film-forming method.
- wherein the vacuum film-forming method is CVD, vacuum deposition or sputtering.

Ikeda et al. discloses an anode (2) for a secondary battery (Fig. 1) wherein the activator layer is formed by a vacuum film-forming method [0038] wherein the vacuum film-forming method is CVD, vacuum deposition or sputtering [0038] to reduce the stress caused by repeated charge-discharge cycles [0011]. Inoue et al. and Ikeda et al. are analogous art because they are directed to lithium secondary batteries. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the anode of Inoue et al. with the method of Ikeda et al. to reduce the stress caused by repeated charge-discharge cycles.

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12. Claims 17, 33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (JP 09245771, see machine translation) as applied to claims 9, 12, 25 and 28 above, in further view of Takada et al. (U.S. 2004/0166409).

Regarding claims 17, 33 and 35, Inoue et al. discloses all claim limitations set forth above, but does not explicitly disclose an anode for a secondary battery:

- wherein a center-line average roughness (Ra) of the anode collector is 1/10 or more of a thickness of the anode collector.

Takada et al. discloses an anode (10) for a secondary battery (Fig. 2) wherein a center-line average roughness (Ra) of the anode collector (11) is 1/10 or more (see Example 2-4, 10/15 > 1/10) of a thickness of the anode collector (11) to prevent the peeling of the anode active material layer from the current collector [0022]. Inoue et al. and Takada et al. are analogous art because they are directed to lithium secondary batteries. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the anode of Inoue et al. with the current collector of Takada et al. to prevent the peeling of the anode active material layer from the current collector.

### ***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sean P. Cullen whose telephone number is 571-270-1251. The examiner can normally be reached on Monday thru Thursday 6:30 a.m. to 5:00 p.m.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on 571-272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. P. C./

Examiner, Art Unit 1795

/Basia Ridley/

Supervisory Patent Examiner, Art Unit 1795